

### Claims

1. A method for reducing the temperature of exhaust gas comprising the steps of  
(1) providing pressurized water with a temperature higher than a boiling point of water under atmospheric pressure, and (2) spraying the water of step (a) into the exhaust gas.
2. A method for reducing the temperature of exhaust gas comprising the steps of  
5 (1) providing pressurized water with a temperature higher than a boiling point of water under atmospheric pressure, and (2) spraying the water of step (a) into a gas cooling chamber containing exhaust gas.
3. A method for reducing the temperature of exhaust gas comprising the steps of  
10 (1) providing pressurized water with a temperature higher than a boiling point of water under atmospheric pressure, and (2) spraying the water of step (a) into an exhaust gas duct containing exhaust.
4. A method according to claim 1, wherein said step (a) of taking water out of a deaerator or taking continuous blow water from a boiler.
5. A method according to claim 2, wherein said step (a) of taking water out of a  
15 deaerator or taking continuous blow water from a boiler
6. A method according to anyone of claims 1-5, wherein said water comprises steam.
7. A method according to anyone of claims 1 and 2 wherein said water comprises an alkaline solution.
- 20 8. A method according to claim 7, wherein said step (a) comprises mixing heated alkaline solution into water.

9. A method according to claim 8 wherein said alkaline solution is selected from alkaline aqueous solution or alkaline slurry solution.

10. A method according to claim 9, wherein said alkaline solution or alkaline slurry solution is an aqueous solution containing a component selected from the group consisting of sodium hydroxide (caustic soda) and calcium hydroxide (slaked lime).

11. A device for reducing the temperature of exhaust gas, comprising:

a gas cooling chamber equipped with a gas inlet, a gas outlet and an ash outlet;

a thermal water tank for storing pressurized water with a temperature higher than a boiling point of water under atmospheric pressure;

5 a temperature reduction water nozzle connected to spray thermal water from the thermal water tank into the gas cooling chamber;

a temperature reduction water volume control valve to adjust the volume of water to be supplied to the temperature reduction water nozzle;

a temperature detector for low temperature exhaust gas flowed from the gas outlet; and

a temperature control device with an opening and closing mechanism for controlling the temperature reduction water volume control valve by means detecting signals from the aforementioned temperature detector.

12. A device for reducing the temperature of exhaust gas, comprising:

an exhaust gas duct;

10 a thermal water tank for storing pressurized water with a temperature higher than a boiling point of water under atmospheric pressure;

a temperature reduction water nozzle arranged to spray water from the thermal water tank into the exhaust gas duct;

a temperature reduction water volume control valve to adjust the volume of water to be supplied to the temperature reduction water nozzle;

15

a temperature detector arranged to detect the temperature of low temperature exhaust gas flowing from the exhaust gas duct; and

a temperature control device with an opening and closing mechanism for controlling the temperature reduction water volume control valve by means of detecting signals from the aforementioned temperature detector.

13. A device according to any one of claims 11 and 12, wherein water is supplied to the temperature reduction water nozzle by means of internal pressure.

14. A device for reducing the temperature of exhaust gas comprising:

5 a gas cooling chamber equipped with a gas inlet, a gas outlet and an ash outlet;  
a thermal water tank for storing pressurized water with a temperature higher than a boiling point of water under atmospheric pressure;

an alkaline solution tank for storing alkaline solution,

a mixer connected to mix water from the thermal water tank and alkaline

10 solution from the alkaline solution tank;

a temperature reduction water nozzle for spraying thermal water containing alkaline solution from the mixer into the gas cooling chamber;

a temperature reduction water volume control valve arranged to adjust the flow volume of water containing alkaline solution supplied to the temperature reduction  
15 water nozzle, an alkaline solution volume control valve arranged to adjust the flow volume of alkaline solution supplied to the mixer;

a temperature detector arranged to detect the temperature of low temperature exhaust gas flowing from the gas outlet;

20 an acid gas concentration detector arranged to detect the acid concentration of the low temperature exhaust gas;

a temperature control device with an opening and closing mechanism arranged to control the temperature reduction water volume control valve in response to signals from the temperature detector; and

an acid gas concentration control device with an opening and closing mechanism arranged to control the alkaline solution volume control valve in response to signals from the acid gas concentration detector.

15. A device according to claim 14, further comprising an alkaline solution heater arranged to heat said alkaline solution and installed in an alkaline solution inlet side of the mixer.

16. A device for reducing the temperature of exhaust gas, comprising:  
an exhaust gas duct, a thermal water tank for storing pressurized thermal water with a temperature higher than a boiling point of water under atmospheric pressure,  
an alkaline solution tank for storing alkaline solution, a mixer for mixing thermal water from the thermal water tank and alkaline solution from the alkaline solution tank, a temperature reduction water nozzle for spraying thermal water containing alkaline solution from the aforementioned mixer into the exhaust gas duct, a temperature reduction water volume control valve for adjusting the flow volume of thermal water containing alkaline solution to be supplied to the temperature reduction water nozzle, an alkaline solution volume control valve for adjusting the flow volume of alkaline solution to be supplied to the aforementioned mixer, a temperature detector for low temperature exhaust gas flowed from the outlet of the exhaust gas duct, an acid gas concentration detector for the aforementioned low temperature exhaust gas, a temperature control device with an opening and closing mechanism for controlling the temperature reduction water volume by means of detecting signals from the aforementioned temperature detector, and  
an acid gas concentration control device with an opening and closing mechanism for controlling the alkaline solution volume control valve by means of detecting signals from the aforementioned acid gas concentration detector.

17. A device according to claim 16, further comprising an alkaline solution heater arranged to heat alkaline solution and installed in an alkaline solution inlet side of the mixer.